

Artificial heart

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An artificial heart is a device that replaces the heart. Artificial hearts are typically used to bridge the time to heart transplantation, or to permanently replace the heart in case heart transplantation is impossible. Although other similar inventions preceded it are going back to the late 1940s, the first artificial heart to be successfully implanted in a human was the Jarvik-7, designed by Robert Jarvik and implemented in 1982.

A synthetic replacement for the heart remains one of the long-sought holy grails of modern medicine. The obvious benefit of a functional artificial heart would be to lower the need for heart transplants, because the demand for organs always greatly exceeds supply.

Although the heart is conceptually a pump, it embodies subtleties that defy straightforward emulation with synthetic materials and power supplies. Consequences of these issues include severe foreign-body rejection and external batteries that limit patient mobility. These complications limited the lifespan of early human recipients to hours or days.

In 1949, a precursor to the modern artificial heart pump was built by doctors William Sewell and William Glenn of the Yale School of Medicine using an Erector Set, assorted odds and ends, and dime-store toys. The external pump successfully bypassed the heart of a dog for more than an hour.

Contrary to popular belief and erroneous articles in several periodicals, the Jarvik heart was not banned for permanent use. Today, the modern version of the Jarvik 7 is known as the SynCardia temporary CardioWest Total Artificial Heart. It has been implanted in more than 800 people as a bridge to transplantation.

Patients who have some remaining heart function but who can no longer live normally may be candidates for ventricular assist devices (VAD), which do not replace the human heart but complement it by taking up much of the function.

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